

# Modbus Gateway User's Manual

## ADM-5850G

### **Functional introduction**

The Modbus protocol is the most widely used protocol in the electronic industrial equipment, and now it has become a general industrial standard. Through this protocol, Modbus devices (such as PLC, DCS, HMI, and instruments) can communicate with each other through a network or serial port. But the Modbus protocol used in the serial port and the Ethernet network is different, so a gateway is needed to complete the communication conversion between the two protocols. ADM-5850G is a modbus gateway product dedicated to connecting Modbus TCP devices and Modbus RTU/ASCII devices.

ADM-5850G has Modbus RTU/ASCII and Modbus TCP protocol conversion functions, it integrates Modbus TCP, Modbus RTU and Modbus ASCII protocol, and the device's serial port can be configured by software of RS-232, RS-485 or RS-422, you can easily achieve Modbus Ethernet devices with Modbus serial devices connected.

### **Product features**

- 1, 32 bit ARM Cortex-m3 CPU
- 2, 1 Port 10/100M Ethernet interface
- 3, Support RS-232, RS-422, RS-485 serial port mode
4. Baud rate, Data bit, Stop bit, Parity bit can be set
5. Integrated ARP, IP, ICMP, IGMP, UDP, TCP, DHCP, DNS, MODBUS TCP, MODBUS RTU, MODBUS ASCII protocol
6. Provide 4 mode of work:  
RTU\_ Master--TCP\_ Slaver, TCP\_ Master--RTU\_ Slaver  
ASCII\_ Master--TCP\_ Slaver, TCP\_ Master--ASCII\_ Slaver
7. Maximum support for 32 Modbus TCP master stations and 4 Modbus TCP slave stations
8. The automatic adaptive function of the time interval of the character
- 9, Provide ID mapping function to realize the management of host ID number
10. The local port, the target IP address, and the target port number can be set
- 11, Can be configured through Web Server, Telnet, MG Configuration tools
- 12, MG Configuration tools support  
Windows98/me/NT/2000/XP/WIN7/WIN8/WIN10 operating system
- 13, Industrial design, can run steadily in bad environment

### **Product specification**

#### **Ethernet**

Standard: 10/100Mbps adaptive Ethernet port  
Communication mode: full duplex / half duplex adaptive  
Transmission distance: less than 100 meters  
Interface type: RJ-45

#### **Serial port**

RS-232 signals: TXD, RXD, RTS, CTS, GND  
RS-422 signals: T+, T-, R+, R-  
RS-485 signal: D+, D-  
Parity bit: None\Even\Odd\space\mark  
Data bits: 6bit, 7bit, 8bit  
Baud rate: 300BPS to 230400bps  
Direction control: RS-485 uses data flow direction automatic control technology

Load capability: RS-485/422 terminal support maximum 32 node polling  
Transmission distance: RS-485/422 is 1000 meters, RS-232 is 10 meters  
Interface protection: 1500W surge protection, 15KV ESD protection  
Interface type: RS-232 terminal DB-9 male, RS-485/422 terminal

### Power Supply

Power input: DC9~48V power supply  
Power consumption: 120mA @ 24V (Max)

### Environmental

Working temperature: -20 C ~ 70 C  
Storage temperature: -40 C ~ 95 C  
Storage humidity: 5 ~ 95% RH

### Package size

Long x wide x high: 103x72x27 (mm)

### Interface definition

RS-232:DB9 male head (TXD, RXD, RTS, CTS, GND)  
RS-422: terminal (T+, T-, R+, R-)  
RS-485: terminal (D+, D-)  
Network interface: RJ45 (Ethernet)  
Power interface: terminal VS+, VS-

### Restore the default settings

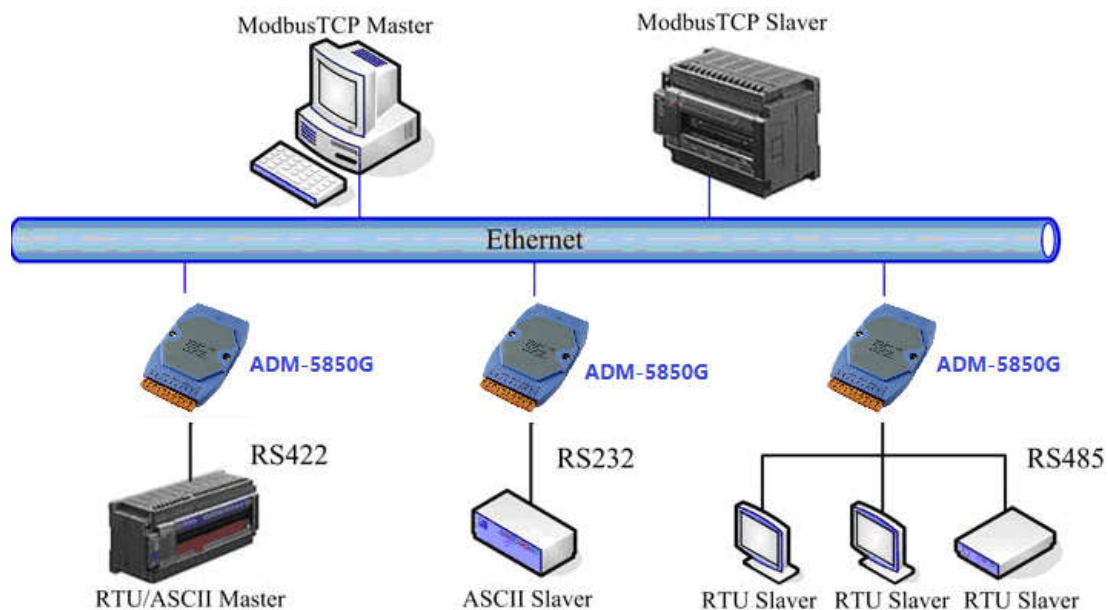
Hardware recovery: Setup and GND short connection, the gateway reboot, and then disconnect Setup and GND, to restore the default settings.

Software recovery: Search the device through the MG Configuration tool software and click to restore the factory settings button.

### LED instructions

Power indication: "PWR" bright red is the normal power supply  
Modbus TCP connection success indication: "Active" is bright green  
Serial data sending and receiving indication: "TX/RX" is Flash

### Typical application



## Configuration instructions

There are three configurations of ADM-5850G, which are the Telnet console, the Web server console, and the MG Configuration PC software configuration.

### Web server console configuration instructions

#### 1. Open the IE browser

Enter the IP address of the ADM-5850G Modbus gateway in the address bar (default: 192.168.10.245)

#### 2. Set the basic parameters

Basic Settings	
Gateway name	<input type="text" value="ADM5850G"/> (0~11)
Gateway address	<input type="text" value="Address"/> (0~11)
Web console	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
Telnet console	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
<input type="button" value="Submit"/>	

**Gateway name:** Device name (less than 11 characters).

**Gateway address:** The location of the device (less than 11 characters).

**Web console:** "Enable" enables Web console, and "Disable" closes Web console.

**Telnet console:** "Enable" enables Telnet console, and "Disable" closes the Telnet console.

#### 3. Network parameter configuration

**MAC address:** The MAC address of the ADM-5850G device can not be changed.

**IP address:** The IP address of the ADM-5850G device in the network.

**Net mask:** Subnet mask.

**Gateway:** Gateway address.

**IP configuration:** The type of IP address, DHCP: dynamic IP automatic acquisition, Static: static IP address.

**DNS server:** When the target IP is a domain name, DNS server is the IP address of the domain name resolution server.

Network Settings	
MAC address	<input type="text" value="00:24:F7:42:23:11"/>
IP address	<input type="text" value="192.168.10.245"/>
Netmask	<input type="text" value="255.255.255.0"/>
Gateway	<input type="text" value="192.168.10.1"/>
IP configuration	<input type="text" value="Static"/> ▼
DNS server	<input type="text" value="0.0.0.0"/>
<input type="button" value="Submit"/>	

#### 4, Serial port configuration

Serial Settings	
<b>Port=01</b>	
Baud Rate	9600 ▾
Data Bits	8 ▾
Stop Bits	1 ▾
Parity	None ▾
Timeout	10 (0~15000)ms
Interface	RS-485 ▾
<input type="button" value="Submit"/>	

**Baud Rate:** Serial baud rate, 300~230400 can be selected.

**Data Bits:** Serial data bit, 6,7,8 bit can be selected.

**Stop Bits:** The stop bit of the serial port can be selected as 1, 1.5, and 2 bits.

**Parity:** Parity bit, None\Even\Odd\space\mark can be selected, default is None

**Timeout (Frame Interval Time):** When the device is set to Modbus RTU protocol mode, data frames are distinguished by serial idle time. If the serial idle time is longer than the frame interval time, the Modbus Gateway confirms that a frame data has been received, and then the frame data is checked and converted into TCP data frame and sent to Ethernet. Timeout (Frame Interval Time) range is (0-15000) ms, set to 0 is automatically adapted frame interval time.

**Note:** *If multiple Modbus TCP master stations and Modbus gateways establish TCP connections, or serial RS-485 bus access multiple Modbus RTU slave stations, Timeout (Frame Interval Time) must be set larger, so that RS-485 slave stations can clearly capture command frames sent by TCP master stations, and the recommended setting is 50ms.*

**Interface:** Serial interface type, can choose RS-232, RS-485, RS-422 three formats.

#### 5, Modbus gateway operation mode configuration

ADM-5850G Modbus Gateway provides 4 work mode:

**(1), TCP\_ Master-RTU\_ Slaver:** Network end connection Modbus TCP master station, serial connects Modbus RTU slave station

**(2), TCP\_ Master-ASCII\_ Slaver:** Network end connection Modbus TCP master station, serial port connects Modbus ASCII slave station

Modbus Operating Settings	
<b>Port=01</b>	
Operation mode	TCP_Master-RTU_Slaver ▾
Max connection	1
Local TCP port	502
Message Timeout	1000 (100~32000)ms
ID Mapping	Auto ID ▾
Fixed ID Value	0
<input type="button" value="Submit"/>	

**Max connection:** The maximum number of connections allowed by Modbus TCP master station is 32. Users can adjust this parameter according to the actual application. When users do not need 32 connections, they can be reduced to improve performance. The effective range of the maximum number of connections is 1~32. You need to change this value when multiple TCP master stations or multiple RTU/ASCII slave stations.

**Local TCP port:** The default port number of the standard Modbus TCP protocol is 502, and the user can modify it according to the actual application.

**Message Timeout (Message Response Time):** Modbus protocol is a master-slave protocol. The master station waits for the slave station to respond after sending the request. The range of Message Timeout (Message Response Time) is 100-32000ms, and the default value is 200ms. *When multiple TCP master stations communicate with RTU/ASCII slave stations, the TCP master station will wait for the response of the RTU/ASCII slave station after sending the request. If the RTU/ASCII slave station does not respond within a set time, then the Modbus gateway will forward the request instruction of the next TCP master station.*

**ID Mapping:** ID mapping capabilities, optional AUTO and Fixed.

**AUTO:** When Auto ID is selected, the ID number in the Modbus TCP master station request frame is not modified and will be sent directly to the serial port slave station device.

**Fixed:** When Fixed ID is selected, the ID number in the Modbus TCP master station request frame is replaced with a fixed ID number and then sent to the serial port slave station device. The serial port slave station device returns the frame, it's ID number is converted to before the change, and then to the Modbus TCP master station.

**Fixed ID Value:** Fixed ID number, when selecting Fixed, Modbus Gateway uses this fixed ID number to access the serial port slave device, the range is 1~247.

**(3), RTU\_Master-TCP\_Slaver:** Network end connection Modbus TCP slave station, serial port connection Modbus RTU master station

**(4), ASCII\_Master-TCP\_Slaver:** Network end connection Modbus TCP slave station, serial port connection Modbus ASCII master station

**Modbus Operating Settings**

Port=01

Operation mode: RTU\_Master-TCP\_Slaver

	IP address	Port	MinID	MaxID	IDoffset
Destination IP address 1	192.168.10.100	502	1	20	0
Destination IP address 2	0.0.0.0	502	21	40	0
Destination IP address 3	0.0.0.0	502	41	60	0
Destination IP address 4	0.0.0.0	502	61	80	0

Domain name format : "/www.xxx.com" Length:20(Max)

Submit

**Destination IP address:** When Modbus Gateway works in TCP\_Slaver mode, it can support 4 Modbus TCP slave connections. Users can set IP address of target host to connect Modbus TCP slave station. When the target connection is not used, the IP address should be modified to 0.0.0.0. Otherwise, the Modbus Gateway device will continuously send the connection request, so that it will affect the network performance. When the target host address is a domain name, "/" is added before the domain name, and "/" represents the domain name. The length must be less than 20 characters

**Port:** The port number of the target host, the default port number of the standard Modbus TCP protocol is 502, and the user can modify it.

**ID mapping:**

**Min ID/Max ID:** The minimum value of ID and the maximum value of ID, and its range is 0~247. When the serial Modbus master station connects TCP slave station, the Modbus Gateway device will check whether the target is within the range, and if it is not in the range, it will not be sent. Max ID can't be less than Min ID, otherwise it is treated as Min ID. When Max ID≤Min ID, the Modbus Gateway device uses Min ID, and the ID range of the 4 connections cannot be repeated, otherwise the error will occur.

**ID offset:** ID offset, the Modbus protocol stipulates that all slave station devices must have a unique ID number (1~247), which is used to identify the slave station address. The ID number of Modbus slave station device can be modified. When the Modbus serial master station access the TCP slave station, the target ID will add the offset and then sent to the Modbus TCP slave station. When the Modbus TCP slave station returns the data, the offset is subtracted from the ID number and then sent to the serial port MODBUS master station.

***Technical support***

**Email:** liuchangshandx@126.com

**QQ:** 513409265

**Website:** [www.volison.com](http://www.volison.com)